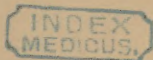


Briggs. (W. T.)

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THE SURGICAL TREATMENT
OF
INTESTINAL OBSTRUCTION;

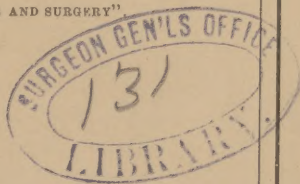
*A Paper read before the Tri-States Medical Society, during its
Annual Session, in Evansville, Indiana,
November, 1879,*

BY

W. T. BRIGGS, M. D.,

PROFESSOR OF SURGERY IN THE MEDICAL DEPARTMENT OF THE UNIVERSITY OF NASHVILLE
AND OF VANDERBILT UNIVERSITY, NASHVILLE, TENN.

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THE SURGICAL TREATMENT

OF

INTESTINAL OBSTRUCTION.

From the earliest period of history, the profession has been divided in opinion as to the propriety of resorting to surgical means in the treatment of internal intestinal obstruction. Some authorities oppose them under any circumstances; some resort to them only in exceptional cases, while still others favor their use after the failure of the ordinary therapeutic means. Praxagoras, 350 B. C., according to Aurelianus, (*Ziemssen's Encyclopedia*) recommended opening the abdomen in the iliac passion. Barbette, in the middle of the Seventeenth Century, proposed it in intussusception, in preference to committing the patient to certain death. Hevin advocated a resort to laparotomy for internal strangulation of the bowels, before the Royal Academy of Surgery of Paris. After a long debate, the members came to the conclusion "that it was better to leave the patient affected with ileus to Providence, even if the case was hopeless, than to endanger the profession and authority of physicians by performing laparotomy." Van Sweiten condemned all operative measures. Cheselden, the father of lateral lithotomy, advised and practiced gastrotomy in hernia, introducing the hand into the abdomen and drawing the incarcerated bowel back into the cavity. In 1852, I saw a case of strangulated hernia, in consultation with an old physician of Kentucky, who strenuously urged a similar operation for its relief, and appeared somewhat disgusted when I decided to do the ordinary operation. Morand, Blanchard, Breschet and others approved of gastrotomy under certain circumstances. Boyer, Dupuytren, Masson, and Testu opposed the operation. The great Velpeau thought it might be undertaken when we had a complete certainty of the existence of a recent strangulation, and when the situation of the disease was well ascertained. Nelaton

says "the most serious objections have been made to this operation. It is, indeed, very difficult to determine the point or seat of the strangulation, and one can only remove it at the expense of manœuvres which singularly predispose to peritonitis. We think that in cases of this kind it is better to have recourse to the establishment of artificial anus—to enterotomy." Trousseau writes: "It appears to me, therefore, that the undeniable success which has attended ovariectomy would justify for the cure of internal strangulation recourse being had to an operation, which, though perhaps more calculated to excite alarm, is sure, more rational and less dangerous than ovariectomy." Watson, in his great work on practice, in discussing the operation in obstructed bowels, says: "And if the peril were my own, and all the other prospects of relief had failed me, I would subject myself to this forlorn hope of rescue." Rokitansky (*Path. Anat.*): "This affection, when diagnosed, most imperatively requires an operative proceeding for the purpose of disentangling and arranging the intestines, and for the division of the strangulating structures." Aitken (*Practice of Medicine*): "When all remedies fail, gastrotomy may be thought of and its chances of success considered." Tanner thinks, "If by a careful and searching examination, we come to the conclusion that the obstruction is in the small intestine and is caused by a diverticulum or by a constricting band of lymph around the bowel, it is the duty of the practitioner to perform gastrotomy. On the contrary, in cases of intramural obstruction, of intussusception, of stricture from contraction of cicatrices, etc., in neither of these instances has an operation any chances of success." George Pollock (*Holmes' System of Surg.*) advises the operation for the relief of internal strangulation, or stricture of the small intestines, or foreign bodies or calculi, but opposes it in intussusception. C. Hilton Fagg says (*Guy's Hosp. Reports*): "I entertain a strong hope that the exploratory operation will hereafter be admitted as a legitimate procedure, and will be successfully practiced in carefully selected, but no doubt exceptional cases of internal strangulation of the intestines." Mr. Benj. Philips (*Medico-Chirurgical Trans.*) concludes "that interference by surgical operation is justifiable when three or five days have passed without any relief from ordinary means, (provided the constipation be complete and the vomiting continues),

because it affords a greater chance for the preservation of life than ordinary means." Erichsen (*Science and Art of Surgery*, Vol. II.) says: "If, however, it can be satisfactorily made out that there is an intestinal strangulation, and more especially if the intumescence occasioned by it can be felt, it will evidently be the duty of the surgeon to give the patient the only chance by the division of the stricture." Bryant (*Pract. Surgery*) writes as follows: "At any rate, as matters now stand, a recovery from an internal strangulation is a matter of wonder, and it would be well, as all collateral experience indicates, that a bolder practice should be employed." Austin Flint, Sr., (*Prac. Med.*) says: "In short, at the time when the operation, if employed at all, would be advisable the chances of recovery would be less than if reliance were placed in spontaneous cure. Even with a view to artificial anus, the operation would be likely to lessen the chances of spontaneous cure. The propriety of surgical interference has, therefore, not many advocates." Ashurst (*Principles and Practice of Surg.* 2nd Ed.) thinks the operation of laparotomy justifiable under certain circumstances. "If, however," he says, "the case be one of intussusception (and this is, as has been seen, the cause of obstruction in the majority of acute cases), the surgeon will, in my judgment, usually consult the best interests of the patient by declining operative interference. In cases of acute obstruction due to other causes than intussusception, there can be no doubt, I think, that laparotomy is justifiable should other means fail to give relief in the course of three, or, at most, four days." Agnew writes (*Surgery* Vol. I.): "When the usual measures for the reduction of intussusception have failed and there is reason to believe that the vitality of the part is not lost, it will be proper to open the abdomen and disengage the invaginated portion of the bowel. When the obstruction is due to strangulation, all remedies except opium are useless; and, when the impediment to the passage of feces is complete, with stercoraceous vomiting, there remains, as the only avenue of escape from death, the operation of laparotomy or enterotomy, though this measure offers but a gloomy prospect of relief. The difficulties which confront the surgeon in these cases are of such a nature that he does not feel at liberty to urge the knife." Gross says (*System of Surgery*, Vol. II.): "I have myself no fancy

for this kind of interference. In internal strangulation depending upon intussusception, a twist or the interception of bowel in an aperture of the omentum, the diagnosis is so uncertain that the proper time for relief is usually allowed to pass before an operation is agreed upon; and, when at length it is performed, the case must almost of necessity terminate fatally."

One of the chief objections urged against the operation of laparotomy in internal strangulation, is that the peritoneal sac is so delicately organized, that the slightest injury is almost certain to be followed by intense and probably fatal peritonitis. Such was the generally adopted opinion when ovariectomy was in its infancy, and it was this bug-bear that for a while retarded its more rapid progress. Dr. Peaslee, in his classical work on ovariectomy, says "that even in 1864, there was not another surgeon in the city of New York to defend the operation." This opinion was maintained, notwithstanding the fact that the peritoneal sac had in numerous instances been injured by accident, lacerated, torn, bruised, and yet patients so injured recovered without any bad symptoms. Mr. George Pollock (Holmes' System of Surg.) relates the following case occurring in the practice of Mr. James, of Exeter: A lacerated wound nine inches long was made through the abdominal walls by a bull. He found the man with a large quantity of small intestines and omentum protruding and covered with dirt, particles of straw, etc. He cleaned and returned them, dressed the wound and sent the patient to St. George's Hospital, fifteen miles distant, in a cart. Not an unpleasant symptom followed; he recovered completely. Dr. Brigham relates a case in the *American Journal of Medical Sciences*, quoted in Eve's collection of surgical cases, which is even more remarkable, showing the tolerance of the peritoneal sac. The patient was a maniacal female, who, in an attempt at suicide with a pair of scissors, made two wounds in her abdomen, one about an inch and a half above the umbilicus, the other half an inch below it. From the upper opening she took out part of the small intestines, from which she cut off a portion seventeen inches in length, when she was discovered by another patient, and the alarm being given, she was forced, not without some resistance on her part, to cease from further injuring herself. This case proceeded to complete recovery, notwithstanding a portion seventeen inches long had

been removed, and the physician in charge simply returned the divided ends into the abdomen. Mr. Durham (Holmes' Surg.) relates seven cases in which the stomach was opened for the removal of foreign bodies. All of these cases recovered.

Statistics show that nearly one-half of the cases of Cæsarian section have been successful, despite the well-known fact that in the majority of cases this operation is only performed as a *dernier resort*, when the patients are already in the very threshold of death.

The latest report of Spencer Wells gives eighty per cent. of recoveries in his operations for the removal of ovarian tumors. In a recent number of the *Detroit Lancet* we find the report of a case in which a woman had been subjected to the operation of gastrotomy three times. In fact the most extensive wounds and injuries of the abdominal cavity are often followed by perfect recovery, unless the intestines be perforated and their contents discharged into the peritoneal cavity. Is it not reasonable to suppose that peritonitis would be more likely to supervene upon an intestine incarcerated or strangulated internally for several days, its circulation interfered with and effusions taking place into the peritoneal cavity, than from a smooth, clean incision into the cavity? Haven's investigations of a large number of cases of obstructed bowels show that in such cases peritonitis is not of frequent occurrence. Peaslee, Sims, and in fact, almost all writers upon ovariectomy concur in the opinion, that in a majority of cases of death following that operation, septicæmia from the retention of septic fluids in the abdominal cavity, and not peritonitis, is the cause. The pathological changes produced by inflammation of the peritoneal membrane, are not of themselves sufficient to produce death, but the effusions which are the result of the inflammatory action, are likely to become decomposed and septic, thereby engendering that most fatal disease, septicæmia. The most rational treatment of peritonitis, in my opinion, would be to make an incision into the peritoneal cavity, remove the effusions which would probably become septic, wash it out thoroughly with an antiseptic fluid, and provide some means by which the cavity could be drained of its noxious contents.

Another objection urged against laparotomy is that the diagnosis is necessarily difficult and uncertain, more especially in re-

ference to the nature and seat of the obstructing cause. That the importance of diagnosis is great, all will admit; that it is difficult, no one will deny; and that the success of all operative measures depends upon it to a great degree, all will acknowledge. Generally there are salient points manifest by which the existence of an obstruction may be determined upon beyond peradventure. The symptoms presented mark out clearly two classes of cases, the acute and chronic, each characterized by peculiar phenomena and produced by special causes. The one brought about by the sudden blocking up of the lumen of the intestine, the other by the gradual diminution of the calibre of the canal by causes which act slowly. The acute variety is characterized by sudden pain paroxysmal in nature, soon followed by vomiting of the contents of the stomach, then of bilious fluids, and finally of fecal matter. Constipation, a prominent symptom, is generally complete from the beginning of the occlusion. In some cases, the contents of the intestine below the obstruction are evacuated spontaneously or by the aid of enemata, after which nothing passes. The sudden vomiting and constipation, are accompanied by great prostration of the vital powers, frequent pulse, hiccough, colliquative sweats, hippocratic face, etc. These symptoms indicate without doubt constriction of the bowels, either situated within or without the abdominal cavity, and admonishes the surgeon to examine carefully the regions of the abdomen at which the bowel may protrude, for the presence of external hernia.

In chronic obstruction, it will be found that for a greater or less time abdominal pain or distress has existed with more or less difficulty in obtaining actions from the bowels; that the gradually increasing constipation is followed by obstruction, evidenced by pain, nausea, vomiting, borborygmus, abdominal swelling, well marked outlines of the bowels seen through the abdominal walls, etc. The acute may, it is true, become chronic, and *vice versa*, but the symptoms and history of the case will be generally sufficient to enable the surgeon to satisfy himself of the existence of an internal strangulation.

He should, however, attempt more than the mere diagnosis of the existence of an obstruction. He should endeavor to locate the exact seat of the occlusion. Sometimes

an examination of the rectum by the finger, or by instruments, will decide the position of the obstruction. The introduction of the entire hand into the lower bowel, as advised by Simon, of Heidelberg, will reveal the trouble high up in the rectum or in the lower part of the sigmoid flexure of the colon. Amussat's plan of injecting the bowel with water and comparing the amount of fluid with the known capacity of the bowel may prove of service. A careful exploratory examination by palpation of the abdomen may detect a tumor which, by its growth, presses upon some portion of the intestines and produces obstruction. By the same means, the enlargement caused by an invagination may be recognized. As a general rule, the acute symptoms indicate that the occlusion is in the small intestines, and the chronic in the large; but, if the cause producing the impediment in the small intestines is slow and gradual in its action, the symptoms will indicate the chronic variety; and, if any cause suddenly produces constriction of the large bowel, the symptoms arising therefrom will be acute in character. Most usually, however, the causes which act suddenly are found located in the small intestines, and those which act more slowly and gradually in the large.

If the obstruction is seated in the upper part of the small intestines, vomiting and collapse come on early, together with a diminution of the urinary secretion. The course of the disease is rapid. There is little or no swelling; should there be any, it is confined to the epigastrium, and becomes diminished after vomiting. The vomited matter is bilious, never stercoraceous. When the seat of the occlusion is in the lower part of the ileum, the swelling is very great, and is confined to the central part of the abdomen, while the regions corresponding to the colon are empty. The course of the disease is here also rapid; vomiting, swelling and prostration come on early. The vomiting soon becomes stercoraceous. When the constriction is located in the lower part of the colon, the course of the disease is less rapid. Vomiting and collapse come on later, and the matter ejected from the stomach is stercoraceous. The distention is considerable and at first is confined to the regions of the colon and cæcum. By close attention to these points, the surgeon may form a very correct opinion of the seat of the obstruction.

Now, to discover the anatomical causes of the obstruction is a still more difficult problem for the surgeon to solve. The causes which may occasion an attack of acute strangulation are internal hernia, volvulus, intussusception, diverticula, bands, knots, openings natural or acquired, gall-stones, intestinal stones, foreign bodies, etc. They produce symptoms so nearly similar that it is often impossible for the surgeon to do more than to form a supposition as to their probable nature. It may be revealed in some cases by characteristic signs, as in intussusception, when there are almost always discharges of bloody mucus, or by the history of a foreign body, previous peritonitis, of hepatic colic with passage of gall-stones, or the discharge from the bowels of intestinal stones. Fortunately, a knowledge of the anatomical causes of obstruction of the intestine is not essential to the surgeon in the treatment of the acute variety of obstruction, but in the chronic form it is highly important. Chronic occlusions are most generally dependent upon impaction of fecal matter in the rectum or colon, or on the mechanical pressure of tumors, intussusception, the matting together of coils of intestines from inflammation of the peritoneum or mesentery producing contraction of the bowel, and stricture of the rectum or colon. Of seventy-six fatal cases of obstruction reported by Bryant (*Practice of Surgery*), three were due to impaction of feces, three to the pressure of tumors, twenty-three to contraction caused by matting together of the intestines, and forty-seven to stricture of the bowel. The nature of the obstruction when caused by fecal impaction is readily discovered by a digital or manual examination of the rectum or colon; when caused by a tumor, it is recognized by palpation and percussion, assisted by vaginal or rectal examinations. If dependent upon stricture of the rectum or colon (benign or malign), it is detected by examination of the rectum or colon, as well as by the difficulty in defecation, the absence of vomiting till near the close of the disease, the great distension of the abdomen, particularly in the lumbar regions. When caused by contraction consequent upon chronic inflammation, the symptoms are dependent on the difficulty of the passage of the contents of the bowel. The nausea is paroxysmal, depending upon the attack of colicky pains which are of frequent occurrence. The ab-

domen is not usually much distended; when it is, the swelling occupies the central or hypogastric region. The peristaltic movements are plainly visible, accompanied with borborismus. The seat of the contraction is most usually in the ileum or cæcum.

From close attention to these points, the surgeon can most usually arrive at a proper conclusion in regard to the nature of the obstructing cause in the chronic variety.

Another objection preferred against laparotomy for the relief of internal occlusion of the intestines, is the high rate of mortality following the operation. There have been comparatively so few operations for the relief of these obstructions that our statistics are very meagre; but we do not think the death rate is higher than that of other capital operations, as hernia, amputation of the thigh in its upper part, ligature of large arteries, etc. It must be recollected that the disease for the relief of which the operation is performed, has a high rate of mortality without the operation. Lichtenstein (*Ziemssen's Encyc.*) says, that in the Vienna General Hospital, out of sixty cases, only six or ten per cent. recovered. In a statistical table, prepared by Whittall, of New York, (*N. Y. Med. Jour.*), laparotomy had been performed in thirty cases of intestinal strangulation from all causes. In three of the thirty cases, the operation was abandoned before completion. Of the remaining twenty-seven, twelve recovered and fifteen died. Of this number, nine are reported as having been in favorable condition and nine recovered. Of the eighteen reported as having been in an unfavorable condition, three recovered. Thus in the favorable cases, there was one hundred per cent. of recovery after the operation, and in the very unfavorable (almost moribund) about twenty per cent. of recoveries.

Prof. John Ashurst has collected ninety-three cases in which the operation was performed, and the number added to that already quoted, makes 123 cases. Of these operations, thirty-one were for the relief of intussusception and ninety-two for other causes. Of this number, thirty-seven recovered and eighty-six died.

It must be remembered that many of the cases included in this table were collected from the remotest period, two having been operated on in the last century. The advance of surgery has

certainly improved our methods of operating and after treatment, so that it is reasonable to suppose that now the rate of mortality would be greatly lessened. When we reflect that the operation has always been and is still performed only as a last resort, after all other remedies have been exhausted, and when the patient is almost moribund from the pathological changes necessarily consequent upon long continued incarceration or strangulation—it is wonderful that the rate of mortality is not higher. Indeed, it is surprising that any case should recover after the operation. The death rate is but little higher than that following the operation for strangulated hernia, and if it were resorted to only under the same circumstances in strangulated hernia as it is in obstruction of the bowel within the abdomen, the rate of mortality would be as high in external hernia as in internal obstruction. Mr. John Birkett (Holmes' System of Surg.) says: "Mr. Hey states that when he entered upon the profession of surgery, now one hundred years since, the operation for strangulated hernia had not been performed by any surgeon of Leeds; and adds that he (Hey) lost three out of five patients upon whom the operation was performed." Mr. Birkett asks: "Are the results of the treatment for strangulated hernia more successful at the present day?" and answers, "We fear not." Bryant (Prac. Surgery) states that in fifty-nine cases of femoral hernia operated on in Guy's Hospital in eight years, the mortality was fifty per cent. in femoral, and sixty per cent. in inguinal hernia; and yet all surgeons agree that the operation for strangulated hernia is a necessity. The intestine obstructed, incarcerated, or strangulated in the cavity of the abdomen differs in no particular from the intestine obstructed, incarcerated, or strangulated in the walls or outside the abdomen. The symptoms, the pathological changes and the consequences are precisely similar. The treatment which would be rational for the one, would be rational for the other. The great object in each is to remove the cause of the obstruction, incarceration or strangulation at the earliest possible moment, since every hour's delay increases the danger to the patient. In the acute variety of intestinal obstruction, whether dependent upon internal hernia, bands, diverticula, volvulus, or intussusception, the physician's art is futile. No benefit can be derived from the administration of medicine. On the contrary, much injury may result therefrom. The

older physicians resorted to balls of lead or antimony, or pounds of shot, or crude mercury, then rolled or shook the poor patient until he was breathless, or made him walk up and down the room for hours. The practice of administering drastic purgatives, adopted by some at the present day, in the hope of breaking through the obstruction, is equally absurd and dangerous. In some rare cases, such treatment might succeed; but oftener it will increase the strangulation by forcing larger portions of the bowels through the constriction; and, by increasing the dragging at the point of obstruction, the inflammatory infiltration is augmented and a greater pressure exerted thereby upon the incarcerated bowel, thus oftentimes increasing the tendency to mortification. The treatment by opium, urged by some surgeons, is of no value, for while it may mitigate the pain and hold the peristaltic action of the bowels in check, it masks the symptoms and leads the surgeon to a false security; fatal changes are going on despite it. Opium, concentrated diet, and large enemata, are the most reasonable means that can be resorted to, because they are less likely to do harm than any other means; and yet we can not see how either one or all of them combined can remove a compressing band, a twist, or an intussusception. Occasionally, it is true, a patient recovers from an internal obstruction of the bowels under the most adverse circumstances, without any operative procedure. The same may be said of external hernia. Occasionally a strangulated hernia is reduced spontaneously after efforts of the surgeon by taxis, etc., have failed; but no prudent surgeon would willingly leave such a case to the chances of a self-reduction. It is unquestionably true that in some cases of intussusception, the bowel does, in some unknown way, right itself, and in others the invaginated portion may slough, pass off, become agglutinated, and a cure result; but such relief is not to be depended upon. Statistics show that not more than one in five recover in this way. Nor is it always desirable that sloughing should take place. It may happen before adhesion of the surfaces of the intestine has been effected; or the bowel, at the point of sloughing, may afterward contract to such an extent as to form a permanent stricture. There is no hope of relief, then, from the actions of medicines, very little, if any, from the efforts of nature. The only relief to be expected is from the surgeon. The means

which he has at his command are abdominal taxis, injection of air or water, puncture of the bowel, laparotomy, laparo-enterotomy, laparo-colotomy.

The abdominal taxis, first recommended by Segar, was practiced as follows: The patient was put in a warm bath and etherized, the limbs drawn up and the shoulders raised to relax the abdominal muscles; then the whole abdomen was rubbed and kneaded from one part to the other. But this method of taxis is too uncertain and empirical to be advised or practiced. And it must be borne in mind that serious consequences might follow from rupture of the bowel at the point of constriction, or in cases of intussusception from the disengagement of the invaginated portion which had become gangrenous, before agglutination had taken place.

Since the days of Hippocrates the inflation of the bowels by the injection of air has been recommended for the relief of internal obstruction, especially when caused by intussusception. The idea was, that by distending the bowel, the invagination is unfolded, and thus the cause of obstruction removed; or the bowel is drawn out of the embrace of a band, or from a knot or loop. In cases of intussusception located in the large intestines, and in the early stages of the disease, before adhesion has taken place, it is reasonable to expect that the invagination might be unfolded, especially if the patient is placed in the knee-elbow position. But if the invagination has lasted for some time, if it has become fixed, or if the symptoms indicate gangrene, or if general peritonitis is present, a resort to inflation is contra-indicated. Indeed, in any case, unless done very gently and with great caution, serious injury may be inflicted upon the parts involved. The same may be said of the forcible injection of large quantities of water.

Another measure which has at times been resorted to by surgeons with reported success, is the puncture of the intestine with a fine trochar for the purpose of removing the gas. With this object in view, it is proposed that the trochar be thrust into different parts of the abdomen, when there is great tympanitis, and the gas allowed to escape. Temporary relief may be given by this operation; but, in my opinion, there is very little chance of any permanent benefit, except

in one particular condition, viz.: in twist of the bowel involving especially the sigmoid flexure, which is kept up by the large accumulation of gas. The effect of the escape of the gas will be to allow the intestine to untwist itself. But this little operation is not entirely devoid of danger, for if the contents of the perforated intestine be fluid, a small quantity may follow the withdrawal of the instrument and get into the peritoneal sac, setting up a general peritonitis.

We have very little confidence in the efficacy of any of these methods. Nothing short of a cutting operation, the opening of the abdominal cavity by incision, discovering and freeing the bowels from constriction, offers any hope of permanent relief. It alone offers the only prospect for the salvation of life. So long as the obstruction remains, the patient is doomed; every hour, every minute, that passes, lessens the chances of recovery. Too often the cutting operation is regarded in the light of a forlorn hope, not to be resorted to until the life of the patient is seriously threatened. In my opinion, death from internal strangulation would be a much less frequent occurrence if the knife were employed earlier in the disease. Death is not caused by the operation; it is due to the pathological changes consequent upon delay in its performance. We would unhesitatingly urge laparotomy early in the course of acute intestinal obstructions, at least as soon as the existence and nature of the obstruction is ascertained, whether dependent upon internal hernia, inflammatory bands, volvulus, knots, diverticula, intussusception, etc. Moreover, if the exact nature of the trouble cannot be satisfactorily determined, the symptoms being urgent and characteristic, we would insist upon an exploratory incision and a search for the cause of the difficulty. Even should we fail to find and remove the cause giving rise to the symptoms, no great harm would be done.

Laparotomy is not a difficult operation, but there are some points connected with it that demand the special attention of the surgeon; for, upon his careful observance of these, the success of the operation often depends. The antiseptic plan of Lister should be scrupulously practiced from the beginning to the end of the operation. The incision in the linea alba should be ample for the easy exploration of the cavity. The distended bowels which

rush out as soon as the incision is completed, should be covered by a soft flannel wrung out of warm water, and not handled until the gas is removed by punctures made at several points with a fine trochar. The examination should be conducted with the greatest gentleness, the hand following the distended bowel downwards or the empty bowel upwards until the point of obstruction is reached. Most generally the distension, as well as the congestion, cease abruptly at the seat of the constriction. The point having been discovered, the bowel should be disentangled in the gentlest manner. If, after a careful search the obstructing cause cannot be discovered, or the bowel be so entangled as to be inextricable, or is found gangrenous, the formation of an artificial anus is the only measure to be adopted. Should a considerable portion of the bowel be gangrenous, it has been recommended to excise it, and unite the two ends by suture. This operation has been performed three times, and one resulted successfully.

The patient should then be turned on his side so that the fluids in the abdominal cavity may escape, and, if necessary, a fine sponge, held in a sponge-holder, should be passed into the cavity sufficiently often to remove any remaining fluids. The incision should be closed with silver sutures including the peritoneum, and the antiseptic dressing applied, supported by a well adjusted flannel bandage. Opium should be administered at regular intervals.

Bland and nutritious diet should be given at stated intervals. The bowels may be opened by an injection of warm water or by some mild laxative after six or eight days.

While the symptoms of the acute variety of obstruction are urgent and rapidly tend to collapse and death, the fatal issue often hanging upon the discretion and firmness of the surgeon in seizing upon the proper moment for action—the chronic is distinguished by symptoms which come on by degrees, and may continue for days or weeks. In most cases the symptoms are so much less urgent than those of the former that it allows time for more thorough consultation, and if surgical treatment becomes necessary, many favorable features towards the prolongation of life, are offered. The surgical means necessary are less dangerous, and the rate of mortality much diminished.

When it is discovered that the obstruction is dependent upon

fecal accumulation in the bowels, the treatment will consist in the removal of the feces by the fingers or scoop, aided by the free use of oleaginous enemata. If due to the pressure of a tumor, either pelvic or abdominal, the tumor should, if possible be removed; or should its nature be such as to forbid its removal, then an opening in the bowel should be made for the escape of the fecal matter. Should the trouble arise from a chronic intussusception, a resort to laparotomy will be necessary—nor should the operation be postponed long, for the reason that adhesion of the invaginated bowel will probably take place, and thus often prevent the good effect of the operation. When the history of the case leads us to believe that the obstruction is caused by contraction resulting from chronic inflammation, etc., more especially if the absence of swelling, the doughy feel of the intestines at a certain point, and the arrest of peristalsis at that particular part be observed—enterotomy is applicable. Manoury was the first to call attention to the establishment of an artificial anus in the ileum in cases of internal strangulation when the obstruction could not be found or removed. Nelaton proposed to abandon the search for the seat and nature of the obstruction with the intention of removing it and to establish an artificial anus in the ileum above the obstruction in order to permit the escape of the accumulated feces, leaving the strangulation to take care of itself. The advantages claimed for this operation are that the peritoneum is injured to only a slight extent, and as the fold of the bowel which first presents itself is the one used for the artificial anus, the entrance of the elements capable of setting up sepsis in the abdominal cavity is prevented and that the operation is less dangerous and much easier of execution than laparotomy. The serious objections to its performance are that the strangulation is not reduced, and that peritonitis may ensue and terminate in gangrene and perforation.

The disadvantages of an artificial anus, which may last throughout life, are very great. While this objection is trifling compared with the preservation of life, yet it will cause the surgeon to pause and consider well every other plan before he determines to resort to its formation. Notwithstanding the recommendation of many distinguished surgeons and their efforts to establish its superiority over laparotomy, we think that the operation of enter-

otomy should be resorted to only in cases of chronic contractions situated in the lower part of the ileum, or in the cœcum, to cases in which the cause of the obstruction cannot be found or removed, and to others in which the condition of the bowel is such as to prevent its return into the cavity of the abdomen after laparotomy. Nelaton's operation is performed in the right iliac region by making an incision commencing an inch above and about an inch and a half to the inner side of the ant. sup. spine of the ilium running parallel to Poupart's ligament to the extent of two inches and a half or three inches. Dividing the tissues, layer by layer, until the deep fascia is reached, tying vessels as may be required, sponging the wound carefully the fascia is cut through when the peritoneum is exposed. It is seized by forceps and incised. Afterwards a silver suture having a curved needle at each end is carried through the intestine in its length, to the extent of an inch; each needle is then carried through the skin at each side of the wound, making a stitch on each side of the incision, after which two others are made, at right-angles to the first, one at the superior and one at the inferior angle of the wound. In this way the intestine is fixed everywhere, laterally and from above downwards, to the walls of the abdomen—by this proceeding no exudation can take place into the peritoneal cavity. It only remains to make a small incision, less than one-third of an inch, into the intestines by means of a sharp-pointed bistoury.

When the history of the case, the symptoms present and a careful examination of the rectum and colon, together with an exploration through the walls of the abdomen leads us to the conclusion that the obstruction is in the large bowel, a recourse should be had to colotomy. For it is certain that obstinate constipation caused by mechanical obstruction in the large bowel is not benefited by the persistent use of purgatives or enemata. On the contrary, injury often results from their use, while opium only conceals the symptoms and deceives the surgeon. When the seat of the disease is in the rectum or sigmoid flexure of the colon, the opening should be made in the left loin, but when the exact location cannot be determined it should be made in the right.

The operation of colotomy was first suggested by Callisen in 1796. Amussat revived the operation and extended it to the

right loin in 1830. Since that period the operation has been performed a great number of times with success.

The rate of mortality has been exceptionally low. It is now recognized as one of the most useful operations and is practiced by almost all surgeons, in obstruction of the large bowel, even when it is known that the obstruction is produced by cancerous deposits and that the relief promised can be of but short duration.

In searching our American medical journals and authorities we find very few cases of internal intestinal obstructions reported in which laparotomy or laparo-enterotomy have been resorted to. The first operation of laparotomy performed in the United States was by Dr. John R. Wilson in 1835, (*Transylvania Med. Journal*) for intussusception, on a negro man living in Rutherford county, Tennessee. The patient had been suffering from colic, stercoraceous vomiting and other distressing symptoms for seventeen days—had taken all the active purgatives, and as a *dernier resort* several ounces of crude mercury had been administered the evening before the operation. An incision having been made through the linea alba into the cavity, the bowel protruded and the portion involved came into view. After some force the adhesion between the invaginated parts gave way. It was feared that the force necessary to sever the adhesion might lacerate the intestine, but no such result followed. The bowel seemed to be on the verge of mortification. It was returned into the abdomen and the incision closed. In a short time the bowels acted. The patient recovered rapidly and completely.

Laparo-enterotomy for obstruction of the intestine was again performed by Dr. Joseph Manlove, of Davidson county, Tennessee, (*Boston Medical Journal*) in July, 1844. The patient, a colored boy 19 years of age, had had no action from the bowels for fifteen days. Had been treated by frequent bleeding, purgatives and repeated enemata. Gastrotomy was determined on. An incision through the walls of the abdomen was made in the middle line. Intricate adhesions had formed between the peritoneum and bowel, and in cutting through the walls of the abdomen an opening was made into the bowel. Large quantities of flatus and feces passed out at once. The wound was closed by sutures and adhesive plaster, except a small portion corresponding with

the opening in the intestine. The amendment in all the symptoms, in an hour, was amazing. The extremities had become warm, pulse full and strong, appetite returned, and he was able to fan himself. The discharge continued from the wound seventeen days, when the bowel acted naturally, the wound healed and the patient recovered perfectly.

Dr. Thomas Wood, of Cincinnati, (Eve's Surgical Cases) reports another case in a man 45 years of age, who had had an external hernia and had pushed it back into the abdomen. No action of the bowel had occurred since the accident. He was found with feeble pulse, sunken countenance, cold perspiration, and at intervals of half an hour, vomiting stercoraceous matter. A thorough examination discovered no hernial tumor at the external or internal rings, or in the canal. It was the opinion that either an invagination, or the portion of the bowel returned, which had perhaps become twisted upon itself and strangulated by adhesive bands, was the cause of the obstruction. The operation of gastrotomy was performed. When the peritoneal cavity had been opened and the omentum raised, the difficulty was discovered to be a part of the sigmoid flexure of the colon strangulated in the sac which had been returned with the bowel. The stricture was divided and the bowel replaced. The patient recovered rapidly.

Prof. H. B. Sands, of New York City, (*New York Med. Jour.* Vol. 1, 51.) reports still another case in which the operation of laparotomy was performed on a child six months old, eighteen hours after the appearance of the symptoms. The obstruction was caused by intussusception. The result of the operation was good and the patient completely recovered.

In the June number of the *American Practitioner*, Dr. J. M. McCormack details a case in which the obstruction was caused by a band extending across the ileum and colon, produced by an old gun-shot wound, in which laparo-enterotomy was successfully resorted to.

To these we are enabled to add three cases of intestinal obstruction occurring in our own practice during the last eighteen months in which laparotomy was performed.

CASE FIRST—LAPAROTOMY FOR INTUSSUSCEPTION. RECOVERY.

In July 1878, I was summoned to meet in consultation Drs. Pyle and Huff near Tullahoma, Tennessee. The patient, Mr. W. T. Bixby, aged 28, a stout athletic farmer, whilst engaged in lifting heavy cross-ties, had been seized with a most excruciating pain in the right iliac region accompanied with nausea and great prostration. He was carried to his residence about a mile distant and Dr. Pyle called to his assistance. The doctor found him nauseated and occasionally vomiting, with feeble pulse, skin cold, clammy and bedewed with perspiration, anxious expression of countenance, and suffering great agony from a constant pain in the lower part of the abdomen. After mitigating the pain with a full opiate, Dr. Pyle gave him a purgative without any result. On the following day he found the patient no better. The pains located in the right iliac region were in no wise relieved. The bowels had not been moved. The abdomen was somewhat distended, but no particular tenderness was detected. The pulse was feeble and quick; the skin was wet with perspiration, cold and clammy. A more active purgative was given, but except to create great commotion in the bowels, aggravate the pain and increase the vomiting, it had no effect. The doctor becoming satisfied that some mechanical obstruction existed, put the patient upon opiates and nourishment in small quantities, together with large enemata, at the same time asking that Dr. Huff, of Manchester, be called in consultation. At the suggestion of Dr. H. three drops of croton oil were administered with the effect of greatly aggravating the abdominal pain and increasing the vomiting. It was then agreed that there was an obstruction of the bowels, probably an intussusception, and that nothing but opium should be given, together with concentrated diet.

Three days afterwards the symptoms still persisting, though mitigated in severity, it was thought best to call a surgeon to consult with them in regard to the propriety of an operation for the relief of the obstruction.

Accordingly I visited him on the tenth day of his sickness. I found him in a semi-recumbent position with an immensely distended abdomen, countenance expressing great suffering, skin bathed in cold perspiration, pulse small and quick, constant hic-

cough, vomiting every five or ten minutes a small quantity of fecal matter, pain still intense in the right iliac region. The bowels had not moved since the first attack. After full consultation it was decided that laparotomy was the only hope of relief left the patient. When the operation was proposed the patient eagerly consented, and even begged that it might be performed without delay. The patient was at once placed on the table and etherized. An incision was made through the walls of the abdomen in the linea alba from the umbilicus to the pubis. As soon as the peritoneal cavity was opened a mass of small intestines, of a very dark color, immensely distended with gas, and with the peritoneal coat ruptured at the convexity of every flexure, protruded. They were in such a condition that it was quickly decided that no examination for the seat of the obstruction should be made until the great distension was relieved. This was accomplished by puncturing the bowel with a small hollow needle which I fortunately had brought with me.

After half a dozen punctures had been made, and a large volume of gas had escaped, the bowel collapsed, and an exploration was commenced for the obstruction by following the coils of the bowel downwards. After three or four feet of intestine had been examined, a portion was reached which had not been distended, and appeared of natural color. At the abrupt termination of the dark and distended bowel an intussusception of six or eight inches was found, the invaginated portion drawn out without difficulty, and the bowel returned to the cavity. A quart or more of dark, fetid sanguineous fluid was mopped out of the abdomen, the sponge being frequently pressed down deeply among the coils of the intestine, after which the cavity was washed out with a solution of carbolic acid. The incision was then closed with silver sutures, a compress and bandage applied, the patient carried to bed, and an opiate enema administered.

Six hours afterwards I left the patient doing well. He was enabled to assume the recumbent posture, the pain which had been persistent was relieved, the pulse less frequent and more full, and the skin less inclined to perspire. He still had hiccough and occasional vomiting. Letters from his physician informed me that after a pretty sharp attack of peritonitis, he recovered completely. The bowels were evacuated on the fifth

day after the operation, and in two weeks he was up. He has continued well since.

CASE SECOND—ENTEROTOMY FOR OBSTRUCTION CAUSED BY
CHRONIC INFLAMMATION. RECOVERY.

Robert Ellis, a thin, emaciated young man, aged 26, printer by trade, of tuberculous tendency, had always been subject to constipation, seldom having more than two evacuations during the week, and he often congratulated himself that he was not troubled in that way like others. For several weeks he had more than usual trouble with his bowels, very seldom having an evacuation and then with difficulty and slight in character. He suffered greatly with borborygmus and occasional nausea. For more than a week previous to my first visit he had had no movement from his bowels. He frequently had a desire to have an action, but when he attempted to defecate, failed. After these attempts he frequently became very sick at the stomach and vomited, and was often faint and covered with cold perspiration. He had taken several active purgatives without any other effect than to increase the nausea and vomiting. My first visit to him was on April 2, 1879. He was in bed with a full pulse, furred tongue, moist skin and an expression of anxiety on his countenance. He had vomited freely a short time previously, and was still nauseated. There was no distension of the abdomen, but the form of the intestines could be plainly seen through the thin abdominal walls, more plainly as the peristaltic action propelled the gas from one point to another. In the right iliac region a firm, hard swelling as large as an orange was discovered, at which point all movement seemed to cease. The swelling was not tender upon pressure, and appeared to be slightly movable. Thinking that the trouble was occasioned by an impaction of feces at that point, I ordered a saline purgative, to be assisted by injections of warm water. Several thin, watery discharges were produced by their combined action and the patient seemed to be much benefitted. The saline was repeated several times afterward, together with enemata, but with no effect.

His nausea, vomiting and prostration continued. On the third day after my first visit, Prof. Roberts, of Hendersonville, a rela-

tive of the patient, saw him with me, and suggested small doses of calomel with extract of belladonna, to be followed by castor oil. No evacuation was induced. For the next ten days, the patient, notwithstanding the administration of various remedial agents, grew gradually worse. He suffered great pain in the abdomen, became very restless, suffered much with nausea and vomited frequently, after which he usually felt easier for some hours, and would take some refreshments, and get a little sleep. The ejections from the stomach were now evidently mixed with stercoraceous matter. The intervals between the vomiting spells became shorter and shorter, and he was rapidly becoming exhausted, when I called a consultation of Prof. Menees and my son, Prof. C. S. Briggs, to consider the propriety of enterotomy for preserving his life. They fully agreed with me that the operation was the only resource left us for preserving the life of the young man. After a full and frank exposition of the case, not omitting to mention the unpleasantness and annoyance of the artificial opening which would be left, he begged to have the operation performed. Accordingly, assisted by Profs. Menees, C. S. Briggs and Drs. M. Baxter and O. H. Menees, I proceeded to perform the operation as follows: An incision commencing an inch above and about an inch and a half to the inner side of the ant. sup. spine. of the ilium was made to the extent of two inches and a half parallel to Poupart's ligament, and carried through the several layers of the abdominal wall until the peritoneum was reached. This was opened on a director, and the finger passed into the cavity to the swelling visible through the walls of the abdomen. It proved to be situated in the lower part of the ileum, just above the ileo-caecal valve, and was caused by thickening of the intestinal coats and adhesions to all the parts around. In fact the parts were so matted together that it was impossible to define clearly the true character of the obstruction. I regarded it as dependent on a tuberculous deposit, with subsequent adhesion, etc. A portion of the small intestine just above the obstruction was seized and brought out of the incision, and silver sutures having curved needle at each end was carried through the intestine in its length on each side of the wound to the extent of an inch, and each needle then carried through the skin at both extremities of the incision. A silver

suture was then passed through the skin at the upper angle, through the bowel and the opposite edge of the incision. Another suture was similarly placed at the lower angle. These sutures having been drawn tight and fastened, the intestine was opened to a small extent. In fifteen or twenty minutes the pent-up contents of the bowel poured through the opening in large quantities, and continued to escape at short intervals. Reaction soon came on, and the patient was much more comfortable during the evening and night. The pain had disappeared entirely. He had no nausea nor vomiting; took some mild nourishment and slept well. He continued to improve rapidly, sitting up in a few days, and expressing himself as feeling very well.

On the sixth day after the operation, the sutures were removed and adhesion between the bowel and the skin found to be perfect. With the exception of the annoyance caused by the excessive flow of the contents of the intestine through the artificial anus, he was in good condition. Inflammation and excoriation were produced by the constant flow of fluids over the skin, and the parts were so tender that no instrument could be adjusted to restrain them. He, however, improved so as to be enabled to dress himself and sit up all day and to frequently go out. Five months after the operation, following an illness of three or four weeks, he died of a tuberculous affection of the lungs.

CASE THIRD—OBSTRUCTION PRODUCED BY AN OVARIAN TUMOR REMOVED BY OPERATION.

In 1873, I performed the operation of ovariectomy upon Miss Mary Hearn, of Wilson County, Tenn. The tumor originated from the right ovary, and was extensively attached to all the parts around. She recovered promptly and returned to her home a month afterward. She continued in fine health until eighteen months since, when she noticed a swelling in her left side, which gradually grew until it attained considerable size. For more than a year past, she has been subject to attacks of constipation, accompanied with nausea, vomiting and great prostration. After a few days of suffering, she would be relieved by mild purgatives, as-

sisted by enemata. The attacks becoming more frequent and obstinate, I was called to see her. Upon inquiry, I learned that the attacks came on without any known cause at intervals of two or three weeks, and were ushered in by nausea, vomiting of stercoraceous matter, with distension of the abdomen and utter prostration of the system. The tumor was about the size of the adult head, firm, circumscribed and elastic. I was satisfied that it was an ovarian cyst, and that the attacks she suffered were caused by pressure on an imprisoned bowel by the tumor, causing an obstruction. I at once tapped the cyst, drawing off nearly a gallon of dark, thick fluid resembling molasses. The sac was evidently multilocular as the trocar had to be introduced several times before the fluid was entirely removed. She was greatly relieved by the tapping, and had no attack for a month, when, the sac becoming again filled, she had the same trouble as before. Her physician tapped her again, giving relief, and he continued to repeat the tapping at intervals of three weeks. But as the frequent tapping and occasional attacks of obstruction were impairing the patients health, I was requested to visit her, with a view to performing some operation for her relief.

Her physician, as well as one or two other physicians who had seen her in consultation, were fully persuaded that the attacks of constipation were due to intestinal obstruction from the pressure of the tumor. I fully coincided with them in this opinion. I proposed to attempt the removal of the tumor, and, if, as I suspected, the adhesions were too extensive to permit its safe removal, to incise its walls, and attach the sac to the walls of the abdomen, leaving an opening for permanent drainage and a contraction of the cyst. Accordingly on the 6th of June last, assisted by her physician, Dr. Hanna, and Drs. Anderson and Fite, of Lebanon, I made an incision five inches in length in the linea semi-lunaris of the left side, and divided the layers seriatim until the sac was reached. It was found closely adherent to the walls of the abdomen and to every other part with which it came in contact. In a cautious attempt to separate the sac from the surrounding part, a coil of intestines was found imbedded in the adhesions between the tumor and the abdominal wall, liberated and as every separation was attended with profuse hemorrhage, I desisted from the attempt, and satisfied myself with an incision into the sac,

afterwards placing a drainage tube through the opening. When the larger sac had been incised and emptied, one or two smaller cysts were discovered, and a trochar passed through the partition, the cyst emptied, and the septum then broken down with the finger. The patient bore the operation remarkably well and reacted kindly. She slept well the night following, and expressed herself as feeling better than she had for months. I received letters from her physician from time to time, all of an encouraging tone. She had no unpleasant symptoms after the operation. The discharge from the cyst passed off freely through the drainage tube and by its sides. The tube was removed on the sixth day. The sac was thoroughly washed out twice a day with a weak solution of carbolic acid. I saw her physician about the 11th of July last, and he reported that the sac was entirely obliterated, and there was very little, if any, discharge passing from the wound; that her general health had been entirely restored, and that she had had no more return of her bowel trouble.

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